10/575265

PATENT COOPERATION TREATY

PCT

INTERNATIONAL PRELIMINARY REPORT ON PATENTABILITY
(Chapter I of the Patent Cooperation Treaty)

(PCT Rule 44*bis*)

Applicant's or agent's file reference 8940.30-304	**FOR FURTHER ACTION**	See item 4 below
International application No. PCT/US2004/033408	International filing date *(day/month/year)* 12 October 2004 (12.10.2004)	Priority date *(day/month/year)* 10 October 2003 (10.10.2003)
International Patent Classification (8th edition unless older edition indicated) See relevant information in Form PCT/ISA/237		
Applicant FIVE PRIME THERAPEUTICS, INC.		

1. This international preliminary report on patentability (Chapter I) is issued by the International Bureau on behalf of the International Searching Authority under Rule 44 *bis*.1(a).

2. This REPORT consists of a total of 11 sheets, including this cover sheet.

   In the attached sheets, any reference to the written opinion of the International Searching Authority should be read as a reference to the international preliminary report on patentability (Chapter I) instead.

3. This report contains indications relating to the following items:

☒	Box No. I	Basis of the report
☒	Box No. II	Priority
☒	Box No. III	Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
☒	Box No. IV	Lack of unity of invention
☒	Box No. V	Reasoned statement under Article 35(2) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
☐	Box No. VI	Certain documents cited
☐	Box No. VII	Certain defects in the international application
☐	Box No. VIII	Certain observations on the international application

4. The International Bureau will communicate this report to designated Offices in accordance with Rules 44*bis*.3(c) and 93*bis*.1 but not, except where the applicant makes an express request under Article 23(2), before the expiration of 30 months from the priority date (Rule 44*bis* .2).

	Date of issuance of this report 10 April 2006 (10.04.2006)
The International Bureau of WIPO 34, chemin des Colombettes 1211 Geneva 20, Switzerland Facsimile No. +41 22 740 14 35	Authorized officer Beate Giffo-Schmitt Telephone No. +41 22 338 87 20

Form PCT/IB/373 (January 2004)

PATENT COOPERATION TREATY

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From the
INTERNATIONAL SEARCHING AUTHORITY

To:

see form PCT/ISA/220

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY
(PCT Rule 43*bis*.1)

Applicant's or agent's file reference see form PCT/ISA/220	Date of mailing *(day/month/year)* see form PCT/ISA/210 (second sheet) **FOR FURTHER ACTION** See paragraph 2 below

International application No.	International filing date *(day/month/year)*	Priority date *(day/month/year)*
PCT/US2004/033408	12.10.2004	10.11.2003

International Patent Classification (IPC) or both national classification and IPC
C07K14/47

Applicant
FIVE PRIME THERAPEUTICS, INC.

1. This opinion contains indications relating to the following items:

- ☒ Box No. I Basis of the opinion
- ☒ Box No. II Priority
- ☒ Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability
- ☒ Box No. IV Lack of unity of invention
- ☒ Box No. V Reasoned statement under Rule 43*bis*.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement
- ☐ Box No. VI Certain documents cited
- ☐ Box No. VII Certain defects in the international application
- ☐ Box No. VIII Certain observations on the international application

2. **FURTHER ACTION**

If a demand for international preliminary examination is made, this opinion will usually be considered to be a written opinion of the International Preliminary Examining Authority ("IPEA"). However, this does not apply where the applicant chooses an Authority other than this one to be the IPEA and the chosen IPEA has notifed the International Bureau under Rule 66.1*bis*(b) that written opinions of this International Searching Authority will not be so considered.

If this opinion is, as provided above, considered to be a written opinion of the IPEA, the applicant is invited to submit to the IPEA a written reply together, where appropriate, with amendments, before the expiration of three months from the date of mailing of Form PCT/ISA/220 or before the expiration of 22 months from the priority date, whichever expires later.

For further options, see Form PCT/ISA/220.

3. For further details, see notes to Form PCT/ISA/220.

Name and mailing address of the ISA:	Authorized Officer
European Patent Office D-80298 Munich Tel. +49 89 2399 - 0 Tx: 523656 epmu d Fax: +49 89 2399 - 4465	Young, C Telephone No. +49 89 2399-7877

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US2004/033408

Box No. I Basis of the opinion

1. With regard to the **language**, this opinion has been established on the basis of the international application in the language in which it was filed, unless otherwise indicated under this item.

   ☐ This opinion has been established on the basis of a translation from the original language into the following language , which is the language of a translation furnished for the purposes of international search (under Rules 12.3 and 23.1(b)).

2. With regard to any **nucleotide and/or amino acid sequence** disclosed in the international application and necessary to the claimed invention, this opinion has been established on the basis of:

   a. type of material:

   ☒ a sequence listing

   ☐ table(s) related to the sequence listing

   b. format of material:

   ☒ in written format

   ☒ in computer readable form

   c. time of filing/furnishing:

   ☐ contained in the international application as filed.

   ☐ filed together with the international application in computer readable form.

   ☒ furnished subsequently to this Authority for the purposes of search.

3. ☒ In addition, in the case that more than one version or copy of a sequence listing and/or table relating thereto has been filed or furnished, the required statements that the information in the subsequent or additional copies is identical to that in the application as filed or does not go beyond the application as filed, as appropriate, were furnished.

4. Additional comments:

Box No. II Priority

1. ☒ The validity of the priority claim has not been considered because the International Searching Authority does not have in its possession a copy of the earlier application whose priority has been claimed or, where required, a translation of that earlier application. This opinion has nevertheless been established on the assumption that the relevant date (Rules 43*bis*.1 and 64.1) is the claimed priority date.

2. ☐ This opinion has been established as if no priority had been claimed due to the fact that the priority claim has been found invalid (Rules 43*bis*.1 and 64.1). Thus for the purposes of this opinion, the international filing date indicated above is considered to be the relevant date.

3. Additional observations, if necessary:

Box No. III Non-establishment of opinion with regard to novelty, inventive step and industrial applicability

The questions whether the claimed invention appears to be novel, to involve an inventive step (to be non obvious), or to be industrially applicable have not been examined in respect of:

☐ the entire international application,

☒ claims Nos. 37,38

because:

☐ the said international application, or the said claims Nos. relate to the following subject matter which does not require an international preliminary examination *(specify)*:

☒ the description, claims or drawings *(indicate particular elements below)* or said claims Nos. 37,38 are so unclear that no meaningful opinion could be formed *(specify)*:

see separate sheet

☒ the claims, or said claims Nos. 37,38 are so inadequately supported by the description that no meaningful opinion could be formed.

☐ no international search report has been established for the whole application or for said claims Nos.

☐ the nucleotide and/or amino acid sequence listing does not comply with the standard provided for in Annex C of the Administrative Instructions in that:

the written form	☐	has not been furnished
	☐	does not comply with the standard
the computer readable form	☐	has not been furnished
	☐	does not comply with the standard

☐ the tables related to the nucleotide and/or amino acid sequence listing, if in computer readable form only, do not comply with the technical requirements provided for in Annex C-*bis* of the Administrative Instructions.

☐ See separate sheet for further details

WRITTEN OPINION OF THE INTERNATIONAL SEARCHING AUTHORITY

International application No.
PCT/US2004/033408

Box No. IV Lack of unity of invention

1. ☒ In response to the invitation (Form PCT/ISA/206) to pay additional fees, the applicant has:

   ☐ paid additional fees.

   ☐ paid additional fees under protest.

   ☒ not paid additional fees.

2. ☐ This Authority found that the requirement of unity of invention is not complied with and chose not to invite the applicant to pay additional fees.

3. This Authority considers that the requirement of unity of invention in accordance with Rule 13.1, 13.2 and 13.3 is

   ☒ complied with

   ☐ not complied with for the following reasons:

4. Consequently, this report has been established in respect of the following parts of the international application:

   ☐ all parts.

   ☒ the parts relating to claims Nos. 1-10, 14,16,17, 27,29,31,32,33

Box No. V Reasoned statement under Rule 43*bis*.1(a)(i) with regard to novelty, inventive step or industrial applicability; citations and explanations supporting such statement

1. Statement

Novelty (N)	Yes:	Claims	5-10, 14,16,17, 27,29,31,32,33
	No:	Claims	1-4
Inventive step (IS)	Yes:	Claims	
	No:	Claims	5-10, 14,16,17, 27,29,31,32,33
Industrial applicability (IA)	Yes:	Claims	1-10, 14,16,17, 27,29,31,32,33
	No:	Claims	

2. Citations and explanations

see separate sheet

Re Item III.

Claim 37 and 38 relate to a modulator of the polypeptide of the invention claimed in absence of any structutural features. This claim is in a reach-thru format and is neither supported by the description or is clear. As such it offends both Article 5 and 6 PCT. For this reason no opinion can be given regarding novelty or inventive step.

For the assessment of the present claims 39-51 on the question whether they are industrially applicable, no unified criteria exist in the PCT Contracting States. The patentability can also be dependent upon the formulation of the claims. The EPO, for example, does not recognize as industrially applicable the subject-matter of claims to the use of a compound in medical treatment, but may allow, however, claims to a known compound for first use in medical treatment and the use of such a compound for the manufacture of a medicament for a new medical treatment.

Re Item IV.

Lack of unity was rasied during the international search. The separate inventions/groups of inventions are:

1-10, 14,16,17, 27,29,31,32,33 (partially)
claims relating to the polynucleotide represented by SEQ ID NO.1
1-10, 14,16,17, 27,29,31,32,33 (partially)
claims relating to the polynucleotide represented by SEQ ID NO. 2
1-10, 14,16,17, 27,29,31,32,33 (partially)
claims relating to the polynucleotide represented by SEQ ID NO. 4
1-10, 14,16,17, 27,29,31,32,33 (partially)
claims relating to the polynucleotide represented by SEQ ID NO. 5
1-10, 14,16,17, 27,29,31,32,33 (partially)
claims relating to the polynucleotide represented by SEQ ID NO. 31

1-10, 14,16,17, 27,29,31,32,33 (partially)
claims relating to the polynucleotide represented by SEQ ID NO. 32
1-10, 14,16,17, 27,29,31,32,33 (partially)

claims relating to the polynucleotide represented by SEQ ID NO. 35
1-10, 14,16,17, 27,29,31,32,33 (partially)
claims relating to the polynucleotide represented by SEQ ID NO. 36
11-13,15,18-26,28,30,33-51(partially)
claims relating to the polypeptide represented by SEQ ID NO. 7
11-13,15,18-26,28,30,33-51(partially)
claims relating to the polypeptide represented by SEQ ID NO. 8
11-13,15,18-26,28,30,33-51(partially)
claims relating to the polypeptide represented by SEQ ID NO. 10
11-13,15,18-26,28,30,33-51(partially)
claims relating to the polypeptide represented by SEQ ID NO. 11
11-13,15,18-26,28,30,33-51(partially)
claims relating to the polypeptide represented by SEQ ID NO. 12
11-13,15,18-26,28,30,33-51(partially)
claims relating to the polypeptide represented by SEQ ID NO. 13

11-13,15,18-26,28,30,33-51(partially)
claims relating to the polypeptide represented by SEQ ID NO. 14
11-13,15,18-26,28,30,33-51(partially)
claims relating to the polypeptide represented by SEQ ID NO. 15

11-13,15,18-26,28,30,33-51(partially)
claims relating to the polypeptide represented by SEQ ID NO. 16
11-13,15,18-26,28,30,33-51(partially)
claims relating to the polypeptide represented by SEQ ID NO. 17
11-13,15,18-26,28,30,33-51(partially)
claims relating to the polypeptide represented by SEQ ID NO. 18
11-13,15,18-26,28,30,33-51(partially)
claims relating to the polypeptide represented by SEQ ID NO. 19
11-13,15,18-26,28,30,33-51(partially)
claims relating to the polypeptide represented by SEQ ID NO. 20

11-13,15,18-26,28,30,33-51(partially)

claims relating to the polypeptide represented by SEQ ID NO. 21
11-13,15,18-26,28,30,33-51(partially)
claims relating to the polypeptide represented by SEQ ID NO. 22

11-13,15,18-26,28,30,33-51(partially)
claims relating to the polypeptide represented by SEQ ID NO. 23
11-13,15,18-26,28,30,33-51(partially)
claims relating to the polypeptide represented by SEQ ID NO. 24
11-13,15,18-26,28,30,33-51(partially)
claims relating to the polypeptide represented by SEQ ID NO. 25
11-13,15,18-26,28,30,33-51(partially)
claims relating to the polypeptide represented by SEQ ID NO. 26
11-13,15,18-26,28,30,33-51(partially)
claims relating to the polypeptide represented by SEQ ID NO. 27
11-13,15,18-26,28,30,33-51(partially)
claims relating to the polypeptide represented by SEQ ID NO. 28
11-13,15,18-26,28,30,33-51(partially)
claims relating to the polypeptide represented by SEQ ID NO. 29
11-13,15,18-26,28,30,33-51(partially)
claims relating to the polypeptide represented by SEQ ID NO. 30

They are not so linked as to form a single general inventive concept (Rule 13.1 PCT) for the following reasons:

1) The present application does not comply with the requirements of unity of invention. 31 separate inventions have been identified. Each of them is characterised by an individual "special technical feature"; there is no technical interrelation between these inventions (see below). The applicants are therefore asked to pay additional search fees. Otherwise the International Search Report will be limited to the first invention specified above [Art. 17(3)(a) PCT; Rule 13(1) PCT; Rule 40 PCT].

2) The following arguments reflect the preliminary opinion of the ISA concerning unity of invention:

2.1. Rule 13(2) PCT demands that "Rule 13.1 PCT shall be fulfilled only when there is a technical relationship among those inventions involving one or more of the same or corresponding special technical features. The expression 'special technical features' shall mean those technical features which define a contribution which each of the claimed invention considered as a whole makes over the prior art."

The PCT Preliminary Examination Guidelines C-III 7.6 state more precisely that "if the common matter of the independent claim is well known, and the remaining subject-matter ... differs without there being any unifying novel concept common to all of them, then clearly there is lack of unity".

2.2. The presently claimed subject-matter does not fulfil the necessary requirements on unity of invention as outlined above:

2.3. In view of the disclosure of the present application, the technical problem to be solved is the following: " the provision of transmembrane variant sequences"

The alleged common technical feature of all solutions to this problem are the sequences represented by the polynucleotides SEQ ID 1, 2, 4-5, 31,32,35, 36 and the polypeptides SEQ ID Nos 7,8,10-18, 20-30

2.4. The available prior art discloses at least one solution to the said technical problem; moreover, the prior art solution shows the above defined technical features:

D1, database accession number AAI80740, exhibits a gene sequence comprising the very sequence ID no 1 first claimed and disclosed as being useful in the context of proliferative, inflammatory and immune related disorders. The solution in its general form as claimed to the problem posed in the present application is therefore not novel as the presently claimed sequence is 1. known as claimed 2. used in the same medicinal context.

In addition to this the description of the present application goes on to state on page 14 paragraph 53 that the polypeptides claimed have 100% identity to a known protein sequence. This sequence is also known to be expressed in
variant form, the database entry cited in the search report BC039859 shows the nulceotide

sequence encoding for such a variant protein. Again this destroys any novel or inventive link between the polypeptides claimed.
The idea that the present sequences are linked together by a novel and inventive concept turns out thus to be invalid in light of the cited art.
Consequently each sequence is regarded as being a separate invention.

2.5. It follows that there is no common special technical feature for the whole scope of the present application that would define an appreciable contribution (e.g. novel and/or non-trivial) over the prior art.

The applicant has not paid additional fees for further inventions for this reason the following opinion will be based on the first mentioned invention namely SEQ ID NO 1 claims 1-10, 14,16,17, 27,29,31,32,33

Re Item V.

1 Reference is made to the following documents:

D1 : DATABASE Geneseq [Online] 6 November 2001 (2001-11-06), "Human polynucleotide SEQ ID NO 800." XP002331290 retrieved from EBI accession no. GSN:AAI80740 Database accession no. AAI80740

D2 : DATABASE EMBL [Online] 15 November 2002 (2002-11-15), "Homo sapiens transmembrane and coiled-coil domains 1, transcript variant 1, mRNA (cDNA clone MGC:48954 IMAGE:5527623), complete cds." XP002331291 retrieved from EBI accession no. EM_PRO:BC039859 Database accession no. BC039859

Novelty Article 33 (2) PCT

As can be inferred from above SEQ ID No. 1 lacks novelty over D1 and D2. Consequently claims relating to DNA *per se* are not considered to meet the requirements of Article 33 (2) PCT. Thus, claims 1-4 are anticipated by both D1 and D2. As D1 and D2 do not explicitly dislcose polypeptide sequence methods of producing these peptidides, antibodies or vectors per se. Thus formally claims 5-10, 14,16,17, 27,29,31,32,33 are regarded as

being novel.

Inventive step, Article 33 (3) PCT

This Authority consider that as the sequence *per se* is neither novel nor inventive all claims dependant on this sequence are trivial applications derviable by the skilled person without the use of inventive skill. Thus claims 5-10, 14,16,17, 27,29,31,32,33 do not meet the requirements of Article 33 (3) PCT.